CLAIMS

1. A method of modifying the biological and/or physicochemical properties of a biological element, said method comprising reacting said biological element with a multivalent polymer having multiple reactive groups so that the biological element is linked to the polymer by a plurality of covalent linkages and is thereby modified such as to change or modify said biological and/or physicochemical properties thereof.

2. A method as claimed in Claim 1 wherein the biological element is a viral vector containing therapeutic genetic material.

3. A method as claimed in Claim 1 or 2 wherein the biological element is an infectious agent such as a virus that normally targets and interacts with particular sites or receptors in a host, characterised in that the polymer modification has the effect of modifying the infectivity of the biological element and/or retargeting it to a new or different site or receptor in the host.

4. A method as claimed in Claim 2 or 3 wherein re-targeting is achieved by incorporating a specific targeting group or moiety in the multivalent polymer and by ensuring that after modification the biological element is sufficiently coated with the polymer as to inhibit targeting and interaction with the original target site or receptor of the host.

5. A method as claimed in Claim 1 which has the effect of modifying the solubility or partition co-efficient characteristics of the biological element in non-aqueous media by virtue of a hydrophobic group incorporated in the polymer.

6. A polymer modified biological element in which the biological element is covalently linked to a polymer having multiple reactive groups such that said polymer is linked to the biological element by at least two covalent linkages and whereby biological and/or physicochemical properties of said biological element are modified.

7. A polymer modified biological element according to Claim 6 wherein the biological element includes therapeutic genetic material.

8. A polymer modified biological element according to Claim 6 wherein the number of linkages between the polymer and the biological element is greater than three.

9. A polymer modified biological element according to any one of Claims 6 to 8 wherein the linkage of the polymer to the biological element and

modification of the latter results in the inhibition of the ability of the biological element to interact in a host biological system with other molecules with which it would otherwise normally interact or in the inhibition of the ability of the biological element to bind to sites or receptors to which it would otherwise normally bind.

10. A polymer modified biological element according to any one of Claims 6 to 9 wherein the polymer is a biologically inert multivalent polymer having a backbone which is substituted by one or more said reactive groups.

11. A polymer modified biological element according to Claim 10 wherein each of the reactive groups is connected to the polymer backbone either directly or via a spacer group.

12. A polymer modified biological element according to Claim 10 or 11 wherein the polymer backbone is based upon monomer units such as N-2-hydroxypropylmethacrylamide (HPMA), N-(2-hydroxyethyl)-l-glutamine (HEG), or ethyleneglycol-oligopeptide.

13. A polymer modified biological element according to any one of Claims 6 to 12 wherein the polymer and/or the linkages between it and the biological element are hydrolytically or enzymatically degradable.

14. A polymer modified biological element according to any one of Claims 6 to 13 wherein the polymer used to modify the biological element is cross-linked such that it forms a hydrogel.

15. A polymer modified biological element according to any one of Claims 6 to 14 wherein a biologically active agent is coupled to or included in the polymer.

16. A polymer modified biological element according to Claim 15 wherein the biologically active agent is one or more of a growth factor or cytokine, a sugar, a hormone, a lipid, a phospholipid, a fat, an apolipoprotein, a cell adhesion promoter, an enzyme, a toxin, a peptide, a glycoprotein, a serum protein, a vitamin, a mineral, and/or an antibody recognising receptor.

17. A polymer modified biological element according to Claim 16 wherein the biologically active agent is an antibody or antibody fragment.

18. A polymer modified biological element as claimed in any one of Claims 6 to 17 wherein the biological element is a virus or other infective micro-organism and wherein the polymer is effective to bring about substantially a complete loss of the infectivity of the unmodified biological element.

19. A polymer modified biological element as claimed in any one of Claims 6 to 18 wherein the modification of the biological element has the effect of retargeting the biological element to different receptors in a biological host.

20. A polymer modified biological element as claimed in any one of Claims 6 to 17 wherein the modification of the biological element has the effect of modifying the solubility and dispersal and stability characteristics of the biological element within a non-aqueous environment.

21. A polymer modified biological element as claimed in Claim 20 wherein the biological element is a micro-organism having oil degradative activity.

22. A polymer modified biological element as claimed in Claim 20 or 21 wherein the polymer incorporates an oleyl or other hydrophobic group.

23. A polymer-modified biological element as claimed in Claim 21 wherein the biological element is a baculovirus particle.

24. A process for the preparation of a polymer modified biological element as defined in any one of Claims 6 to 23 which process comprises combining a biological element with a polymer.

25. A polymer modified biological element obtainable by the process according to Claim 25.

26. A polymer modified biological element as defined in any one of Claims 6 to 19 for *in vivo* delivery of therapeutic genetic material to a patient, wherein the polymer modified biological element comprises a biological element which includes the therapeutic genetic material.

27. A method of gene therapy which method comprises administering to a patient in need of such therapy a polymer modified biological element as defined in any one of Claims 6 to 20 which includes therapeutic genetic material.

28. Use of a polymer modified biological element as defined in any one of Claims 6 to 20 in the manufacture of a medicament for use in gene therapy wherein the polymer modified biological element comprises a biological element which includes therapeutic genetic material.

29. A composition comprising a polymer modified biological element as defined in any one of Claims 6 to 18 in association with a carrier.

30. A composition as claimed in Claim 29 wherein the carrier is a pharmaceutically acceptable additive, diluent or excipient.

31. Use of a polymer-modified biological element as claimed in any one of Claims 20 to 23 for treatment of oil pollutants or for delivery of biological pesticides to pathogens in the agricultural industry.